



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/558,917

08/29/2006

Michael S. Wong

1789-12702

8501

23505

7590

03/07/2008

CONLEY ROSE, P.C.

David A. Rose

P. O. BOX 3267

HOUSTON, TX 77253-3267

EXAMINER

JOHNSON, KEVIN M

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

03/07/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/558,917	<b>Applicant(s)</b> WONG ET AL.	
	<b>Examiner</b> KEVIN M. JOHNSON	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 January 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 19-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 19-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/1/2005 and 1/8/2008</u> .                                  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Status***

1. The amendment canceling claims 13-18 and adding new claims 19-26 has been entered. Claims 1-12 and 19-26 are pending and presented for examination.

### ***Election/Restrictions***

2. Applicant's election without traverse of group I, claims 1-12, in the reply filed on 1/8/2008 is acknowledged.

3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

### ***Information Disclosure Statement***

4. The information disclosure statements (IDS) submitted on 12/1/2005 and 1/8/2008 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.

The lined through international search report and preliminary report on patentability do not constitute proper prior art, but the references within have been considered as they were listed separately.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 1793

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 2, 4-6, 11, 19-23, 25 and 26 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Wong et al. (Nano Letters, 2001, Vol. 1, No. 11, p 637-642).

In regards to claims 1 and 2, Wong teaches a method of producing mesoporous metal oxides using nanoparticle precursors. The method comprises preparing a colloidal nanoparticle sol and a solution of a surfactant and a tungstate salt, mixing the solutions, drying the material and then the calcination of the dried material (column 1, p 638). The calcination step removes the pore-forming surfactant from the composition, yielding a porous catalyst.

In regards to claim 4, Wong also teaches a method of producing a mesoporous metal oxide catalyst where instead of using pre-formed nanoparticles, a precursor salt was added to the surfactant solution.

In regards to claims 5 and 19, Wong teaches the use of zirconium oxide (column 1, p 638), titania (column 2, p 640) and alumina nanoparticles (column 1, p 641).

In regards to claim 6, Wong teaches the aging of the mixture for two days (column 1, p 638).

In regards to claim 11, the mesoporous oxide produced by Wong was found to be completely amorphous (column 1-2, p 638).

In regards to claim 20, Wong utilizes tungsten as the catalytic component (column 2, p 637).

In regards to claims 19-23 and 25-26, the surfactant used by Wong is a nonionic poly(ethylene oxide)-poly(polypropylene oxide)-poly(ethylene oxide) triblock copolymer of the form EO<sub>20</sub>PO<sub>70</sub>EO<sub>20</sub> in conjunction with zirconium oxide nanoparticles and a catalytic component comprising tungsten.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 9, 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wong as applied to claim 1 above.

In regards to claims 9 and 10, it would have been obvious to one skilled in the art at the time of the invention that due to the surface area of  $130 \text{ m}^2/\text{g}$  and  $\text{WO}_3$  loading of 30.5 wt-%, the surface density of the tungsten oxide on the zirconia would be approximately  $6.0 \text{ molecules/nm}^2$ . It is known in the art that the monolayer surface density of tungsten on a zirconia support is  $4 \text{ molecules/nm}^2$ , and therefore the surface density of the material produced by Wong exceeds the monolayer surface density of the catalytic component.

In regards to claim 12, polymerization of the first catalytic component is considered to be inherent to the process taught by Wong, as the process is the same as the process described in the instant application that produces a material with a polymerized first catalytic component.

11. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wong as applied to claim 1 above, and further in view of Soler-Illia et al. (New J. Chem., 2001, 25, p 156-165).

In regards to claims 7 and 8, Wong teaches a method of producing a porous metal oxide catalyst utilizing metal oxo clusters. While Wong fails to teach that a gel-network is formed, Soler-Illia teaches a method of forming titanium oxo based organic-inorganic networks that form xerogels when allowed to dry (column 2, p 159). It would

Art Unit: 1793

have been obvious to one skilled in the art at the time of the invention that a process such as the one taught by Soler-Illia could be substituted for the process of forming the metal oxide as taught by Wong. This modification would be motivated by the suggestion of Wong that the method of Soler-Illia is analogous to the process of using aluminum oxo clusters disclosed (column 1, p 641).

12. Claims 3 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wong as applied to claim 1 above, and further in view of Edler et al. (J. Chem. Soc., Chem. Commun., 1995, p 155-156).

In regards to claims 3 and 24, Wong fails to teach the use of the cationic surfactant cetyl trimethyl ammonium bromide (CTAB). Edler teaches the use of CTAB as the pore forming agent when producing a mesoporous silica molecular sieve (column 1, p 155). It would have been obvious to one skilled in the art at the time of the invention to substitute CTAB for the pluronic P123 surfactant used by Wong in the synthesis of the mesoporous metal oxide. This would have been motivated by the teaching of Wong that the nonionic surfactant used bonds with a hydrogen ion to achieve a positive charge (column 2, p 640), allowing it to act in a similar manner to cationic surfactants, and the suggestion that other types of surfactants could be used (column 2, p 641).

### ***Conclusion***

13. All claims are rejected. No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEVIN M. JOHNSON whose telephone number is

(571)270-3584. The examiner can normally be reached on Monday-Friday 7:30 AM to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KMJ

**/Jerry A Lorengo/  
Supervisory Patent Examiner, Art Unit 1793**